



Pediatric Clips

Hematuria — Abiodun Omoloja, MD

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Pediatric Clips from The Children's Medical Center are quick reviews of common pediatric conditions.

The Children's Medical Center is the region's pediatric referral center for a 20-county area. As the only facility in the region with a full-time commitment to pediatrics, Children's offers a wide range of services in general pediatrics as well as in 35 subspecialty areas for infants, children and teens. We welcome your inquiries about services available — call 937-641-3666 or e-mail marketing@childrensdayton.org.



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CASE: 12-YEAR-OLD WITH BLOOD IN THE URINE

Chris is a 12-year-old African-American male with a history of microscopic blood in his urine for over five years and a family history of kidney stones. Routine yearly well examinations and sport physicals have documented the hematuria. About five years ago he was evaluated by a pediatrician; they do not recollect the outcome of that evaluation.

He denies back pain, facial or feet swelling, gross hematuria,

tea-colored urine, dysuria, frequency or enuresis. He has not had a documented urinary tract infection. Other than mild reactive airway disease, his medical history is unremarkable.

He is actively involved in the school basketball team.

His father has a history of kidney stones for the past three years but has not had any surgical procedure; his last episode of abdominal pain and gross hema-

turia being a year ago; has no knowledge of the type of stone.

Two other male siblings and the mother have no history of blood in the urine and don't have any medical problems. Nobody in the immediate and extended family has any hearing defects.

Physical examination was unremarkable, as his blood pressures, weight and height were within normal for age.

EVALUATION/RECOMMENDATIONS

Microscopic hematuria is one of the most common reasons for a nephrology referral with the above presentation being typical.

As in any medical evaluation, obtaining a good history is key to identifying the etiology of the problem. The presence and/or absence of pain at urination, skin rash, gross hematuria and hearing defects in family members are helpful information in narrowing down the differential diagnosis and ordering the necessary investigations. Other important family history is the presence of hematuria in biological parents or siblings, history of sickle cell disease or trait.

The persistence of micro-hematuria for five years makes the possibility of viral cystitis / UTI unlikely as hematuria eventually resolves. The family history of kidney stones is very interesting, as a strong familial occurrence is very common, although typically intermittent colicky abdominal

pain and gross hematuria are present. Inquiry regarding the presence of sickle cell disease or trait in family members (including extended) is of utmost importance even in Caucasian patients. Occasionally, requesting hemoglobin electrophoresis might be needed if the patient is adopted and has gross hematuria.

Absence of facial or feet swelling suggests the absence of significant proteinuria. The timing of collecting urine sample for testing should always be known because of the possibility of exercise-induced hematuria. This is a benign condition typically seen after intense physical activity (trauma related, biking, etc.). The hematuria completely resolves and is of no clinical significance.

Initial workup should include the following:

1. Urine analysis (UA) on a freshly voided urine sample preceded by minimal or no physical activity. The specific gravity,

presence/absence of red blood cell (RBC) casts, proteinuria and number of RBCs are very important aspects of the evaluation. Less than 10 RBCs per hpf will render a low yield in any work-up.

2. A random creatinine and calcium estimation on the urine sample is helpful and is a cost-effective test. A calcium to creatinine ratio above 0.2 is suggestive of abnormally high calcium excretion in the urine, a precondition for the formation of the most common type of kidney stones, calcium oxalate stone and associated with microscopic hematuria.
3. Renal panel to assess renal function.
4. Renal and bladder ultrasound is the initial imaging study of choice because of its non-invasiveness, lack of radiation and relative ease. It serves as a good screen to document

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Continued from the front.

normal genitourinary anatomy and detection of renal stones. I have come across horseshoe and pelvic kidney during evaluation of microscopic hematuria. Should be done if hematuria is significant (>10 RBCs).

5. Complement C3 & C4 to be done if significant hematuria or presence of RBC casts as normal levels reduce the possibility of recent post-infectious glomerulonephritis, membranoproliferative glomerulonephritis (MPGN) and lupus nephritis. A low level could help to diagnose an asymptomatic acute post-streptococcal glomerulonephritis.

Renal panel, C3 & C4 were normal. The UA performed on Chris showed 1+ blood, no protein, specific gravity of 1.020 (similar to initial UA 5yrs ago), 10-20 RBCs and no RBC casts. Calcium creatinine ratio was less than 0.2. Renal and bladder ultrasounds were normal with no calcifications, normal bladder wall thickness. No abnormal anatomy was visualized and renal sizes were appropriate for height and age.

Based on the initial negative results, UA on Mother's first morning urine sample was done. Father's urine was not tested, but a negative urine would have been significant despite the history of documented renal stones.

Based on the history, physical exam, laboratory and imaging studies, the diagnosis is benign hematuria.

Featured specialist



Abiodun Omoloja, MD, is a pediatric nephrologist in the department of nephrology at The

Children's Medical Center of Dayton. Dr. Omoloja received his medical degree from University of Ilorin, Nigeria. He completed his

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The department of nephrology at Children's provides comprehensive diagnostic and treatment services for the entire range of disorders of the kidney, urinary tract and hypertension. Inpatient and

outpatient consultations are available for patients with electrolyte acid base and blood pressure disorders. Consultation for calcium and phosphorus disorders and blood pressure disorders are also provided.

The department offers specialized procedures for renal replacement therapy including hemodialysis, peritoneal dialysis and hemo-filtration/hemodi-afiltration (CAVH/CVVH) for acute inpatients. The department works closely with urologic and pediatric surgeons to provide comprehensive management of patients through a combined renal-urologic clinic.



For further information,
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